THE MARINE CORPS BASIC TRAINING EXPERIENCE: PSYCHOSOCIAL PREDICTORS OF PERFORMANCE, HEALTH, AND ATTRITION

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THE MARINE CORPS BASIC TRAINING EXPERIENCE:

Psychosocial Predictors of Performance, Health, and Attrition*

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SUMMARY

The psychological stresses of Marine Corps basic training (BT) may influence training outcomes. This study is part of a project undertaken at the request of the Commandant of the Marine Corps to assess the actual effects of BT stresses. Recruits are not all alike and how a recruit responds to BT stresses may depend on his social background and personality characteristics. Our objective in this study was to identify recruit characteristics which should help achieve a better understanding of BT stress effects. Taking recruit characteristics into account can help evaluate stress effects by removing the effects of background or personality differences on BT outcomes and by helping to identify recruits who may be particularly susceptible to stress and who therefore would be most strongly affected.

Previous research findings led to consideration of five categories of individual differences: Social background (e.g., past history of truancy, parents' marital status); Coping mechanisms (positive styles of adapting to stress and managing emotions); Defense mechanisms (negative styles of adapting to stress and managing emotions); Motivational measures (including perceived motivational characteristics of the recruit role, locus of control, and expected success in the Marine Corps); and General characteristics (age, race, and General Classification Test scores).

The instruments for measuring the individual differences outlined above were completed by 2,648 volunteers. BT outcomes were assessed by data from Marine Corps records including: performance during BT; health during BT; attrition from BT; and attrition in the first 27 months following BT. Correlational procedures and stepwise regression were used to determine the relationship between performance and health and the individual difference measures. Analysis of variance and discriminant function analysis were used to identify predictors of attrition.

Results indicated that: (a) GCT was the most important predictor of BT performance, but race, Chance locus of control, high school grades, and having had to repeat a year of school also predicted several of the performance measures. (b) Health during BT was not strongly related to any of the individual difference measures. (c) The minimum set of predictors for BT attrition would include one coping measure (suppression), one defense mechanism

(displacement), one motivational measure (expectation of success in completing the enlistment), and one social background measure (high school grades), in addition to GCT, and age. (d) Recruits possessing the psychosocial profile that characterized BT attrites were less likely to be rapidly promoted or retained in the FMF. (e) FMF attrition depends upon factors other than the BT attrition risk profile. More specifically, fewer years of education and greater frequency of having been expelled from school predicted FMF attrition even after accounting for the BT attrition risk profile.

The object of the study was to identify a small number of individual differences which were particularly likely to be important for understanding the effects of BT stresses. On the basis of the combined attrition and performance findings, GCT, suppression, displacement, enlistment expectations, high school grades, and age should be included in BT stress studies. Suppression, displacement, and enlistment expectations measures are of particular interest because of their importance for theories of stress and emotion.

The finding that the BT attrition risk profile is associated with less success in the FMF indicates that BT attrition is eliminating some recruits who would do poorly in the FMF. The additional importance of years of education and number of school expulsions suggests that in addition to the BT risk factors, mild social delinquency patterns contribute to FMF attrition.

CONTENTS

INTRODUCTION

Marine Corps Basic Training (BT) transforms young men and women from civilians into Marines. The transformation process subjects recruits to performance demands and psychological stresses which are similar for all services (1-3). However, the stress may be most intense in Marine Corps basic training (4). The Naval Health Research Center was tasked with identifying the specific stresses in Marine Corps basic training for males and determining the positive and negative effects of those stresses (5). This paper describes the relationship between recruits psychosocial characteristics and BT performance, health, and attrition to identify recruit characteristics which might influence reactions to BT stress.

Research Approach

A recruit's psychosocial characteristics are those demographic, social background, or personality attributes which describe him when he enters BT. Our concern with psychosocial characteristics was motivated by two possibilities. The primary concern was that a recruit's psychosocial attributes might determine how BT stresses affected him. A secondary concern was that recruit differences might obscure the effects of BT stresses. Both possibilities had to be addressed to ensure that our research program produced a meaningful description of BT stress effects.

Psychosocial characteristics may modify reactions to BT stresses. Marine recruits who adapt well to BT will not be affected by stresses as much as recruits who have less ability to adapt (6-9). BT stress-outcome relationships should be stronger in the second group than the first. Statements describing the average effect of stress may hide the fact that some recruits were substantially affected by stress and others totally unaffected. Therefore, psychosocial factors should be examined in stress studies to achieve a more precise picture of stress effects.

Individual differences between recruits also can directly affect BT performance. If so, failing to take psychosocial causes of performance differences into account will also lead to imprecise estimates of stress effects. For example, suppose BT stress impairs academic performance. If a group of recruits under high stress is compared with a group under low stress, the low stress group may perform better if all other things were equal. However, the high

stress group could be composed of recruits with greater learning ability. The stress effect would be offset by the effect of ability on performance. Therefore, it would be improperly concluded that stress did not affect academic performance. Similar logic can be applied to other psychosocial characteristics, such as motivation, and to any outcome that is affected by one or more psychosocial characteristics.

The possible impact of psychosocial characteristics on BT outcomes can be examined by including appropriate psychosocial measures in BT stress studies. Characteristics which may be important include age, intelligence, prior schooling, motivational variables, emotional reactions to training, ability to cope with stress, and a past history of antisocial behavior (10-23). This list was too long to include each of these psychosocial factors in our entire series of stress studies. The present study was designed therefore to select key predictors from this initial list for use in our later studies of BT stress effects. The criterion for identifying an important characteristic was its usefulness in predicting either BT performance, BT health, or BT attrition.

To simplify the presentation of our hypotheses and findings, psychosocial characteristics will be discussed in terms of five general categories described below with hypotheses describing the general pattern of expected associations. The hypotheses were based on prior research findings (10-23).

Social background included 15 items representing specific social behaviors (e.g., truancy) or exposure to a specific social background (e.g., urban vs. rural childhood home). The background items chosen were known to predict BT outcomes (10,13). It was hypothesized that prior evidence of poor social adaptation (e.g., truancy, poor school performance, limited participation in social activities) would predict negative BT outcomes.

Coping mechanisms included 10 scales representing psychological characteristics which should facilitate effective adaptation to stress and control of emotions (6,7). High scores on coping scales were expected to be associated with positive BT outcomes.

Defense mechanisms comprised 10 scales representing psychological characteristics that should interfer with effective adaptation to stress and control of emotions (6,7). High scores on defense mechanism scales were expected to be associated with negative BT outcomes.

Motivational factors included measures of 11 psychological factors which should affect how hard recruits tried to achieve high performance. These scales included measures of the expected motivational characteristics of the recruit role, personal motivation reflected in locus of control measures, and expectations regarding Marine Corps success. It was hypothesized that perceiving the recruit role as motivating, having a high expectancy of success, and feeling high internal control/low external control would predict positive BT outcomes.

Other characteristics were age, race, and GCT. Although these three variables are sometimes regarded as social background, they were treated separately because they do not represent specific social behaviors or exposure to a specific social environment. It was expected that higher GCT scores would be related to better performance. No specific predictions were made for race or age.

METHOD

Participants

Between 19 April and 7 June, 1980, 2,648 male Marine Corps recruits participated in this study. These recruits were drawn from 44 basic training platoons with an initial total membership of 2,870 recruits. The sample therefore consisted of 92.4 percent of the initial platoon strengths. The remaining recruits either did not volunteer to participate or had conflicting schedules which prohibited them from attending the testing session.

The average recruit in this sample was 18.9 years of age (S.D. = 2.0), had 11.7 years of schooling (S.D. = 1.0), and an average GCT score of 104.5 (S.D. = 16.6). The race composition of the sample was 69% White, 16% Black, 7% Hispanic, and 5% other groups (e.g., Guamanian, American Indian). Of the recruits, 63% were high school graduates, 8% had graduate equivalency degrees, and 28% had not graduated from high school. Additionally,74% of the recruits never repeated a school year and 23% repeated one or more years. The majority of recruits were single (93.3%), but a few were married (4.7%), and a small number were divorced (1.2%). Percentages do not sum to 100 due to missing data.

Data Collection

Recruits were tested in groups of 200 to 400. Group size depended on the number of recruits available for the session. During these sessions, recruits

completed questionnaires designed to assess individual differences which might influence how they would react to stress. The testing sessions averaged 2 hours in length, including the time required to obtain informed consent. Performance, health, and attrition measures were obtained from Marine Corps records after the recruit completed BT. Specific measures are described below.

Questionnaires

Questionnaires were administered verbally to standardize sessions and minimize the possible effects of reading problems. Except for the background questionnaire, recruits marked their responses on optical scanning forms after each question was read over a loudspeaker system. Background questions were answered by marking the appropriate space on the questionnaire. Specific instruments included:

Social Background: The social background items reflect the type, amount, or quality of some social behavior. All social background measures were obtained from the Background Questionnaire (see Appendix A). This questionnaire was based on earlier work by Plag (10) and La Rocco, Ryman, and Biersner (13).

Coping Mechanisms. Ten aspects of coping were measured with scales developed by Joffe and Naditch (29). These scales measure a range of psychological attributes that may help one adapt to stress. These attributes include effective use of cognitive resources to solve problems, accurate environmental perceptions, accurate self-perceptions, and appropriate control of emotions (7). Definitions for the specific coping mechanisms are given in Appendix B. These scales are composed of true-false items.

Defense Mechanisms. Ten defense mechanisms were measured with scales developed by Joffe and Naditch (29). The defenses measured involve illogical thought processes, inaccurate perceptions of self or the environment, and/or inappropriate control of emotions (7). The use of defense mechanisms is generally expected to hinder effective adjustment. Definitions for the defense mechanisms are given in Appendix B. These scales were composed of true-false items.

Motivational Factors: Motivational measures were obtained with three separate instruments. Job Motivation was measured using Section Two of the Job Diagnostic Survey: Short Form (24). The 14 items measured the perceived motivational characteristics of the recruit role. The standard form of this instrument was slightly modified because recruits were instructed to describe

what they expected in BT rather than being asked to describe a job they currently held. The items were formulated as expectations by prefacing each question with "I expect . . " and referring to "recruit training" where the original questionnaire referred to the "job." Separate scores were computed for the seven subscales in this instrument. These subscales are defined in Appendix B. Response alternatives ranged from "Strongly Disagree" (1) to "Strongly Agree" (7).

The second type of motivational measure was enlistment expectations. Items concerning these expectations assessed the recruit's belief that he would complete his first-term enlistment and that he would reenlist. The items used were those employed by Youngblood, Laughlin, Mobley and Meglino (20). Response alternatives were the same as those for the Job Diagnostic Survey.

The final type of motivational measure was locus of control. Beliefs about determinants of task success are personality characteristics that affect task motivation. These beliefs are frequently studied as "locus of control" perceptions. Perceived locus of control was measured with Levenson's Attitude Statement Survey (25-28) which assesses the person's beliefs that what happens to him or her depends on his or her own actions (Internal control), on fate or luck (Chance control), or on other people's actions (Powerful Others control). The 24 items (8 for each of these three scales) were administered with the 7-point response scale described above.

Other Recruit Attributes. The final category included age, race, and General Classification Test (GCT) scores. These are attributes that did not fit readily into any other category. Age and race are sometimes treated as social background measures, but these are not direct indicators of the type, quality, or quantity of any actual social behaviors. GCT is a psychological characteristic, but is not readily classified as coping, defense, or motivation even though it may be related to all three. Age and race were obtained by self-reports in the Background Questionnaire. GCT was obtained from Marine Corps records.

Training Performance Measures

The following performance measures were obtained from training records:

(a) Practical examination scores. Examinations covering a range of academic subjects were taken at the end of the first two weeks of BT and during the last two weeks. The first test provided one overall score while the second

yielded separate oral and written scores. Maximum possible scores were 100 points for the first test and 50 points for each subtest at the end of BT.

(b) Physical fitness. Fitness tests were comprised of the number of pull-ups, number of sit-ups, and the time for a 3-mile run. These tests were administered at approximately the same time as the academic tests. The maximum possible score was 300 points.

(c) Rifle marksmanship. The results of firing the M-16 rifle for qualification were obtained. Qualification took place at the end of the fifth week of BT. The maximum possible score was 250 points.

(d) Drill Instructor ratings. Ratings are made by Drill Instructors at the end of BT. Conduct ratings indicate the extent of the recruit's adherence to both the letter and spirit of regulations during training. Senior Drill Instructor Subjective Evaluation (SDISE) is an appraisal of the recruit's initiative and skills in the performance of routine duties and nonroutine tasks during training. These ratings are made on a 5-point scale.

Health Measures.

Health records kept at the Marine Corps Recruit Depot Dispensary were reviewed. Number of illness incidents was determined for three major categories of illness: (a) upper respiratory infections and/or viral syndromes (VIRAL), (b) musculo-skeletal injury or trauma (TRAUMA), and (c) "other" diagnoses (OTHER). The number of incidents in each category was a separate variable in the analyses. In addition, a total illness incidents score was computed by summing the values for the three categories. Other health measures were the total number of dispensary visits, the number of days assigned to light duty, and the number of days of bed rest. Health data were collected on a random 50% of the recruits from each platoon because of time constraints and administrative considerations.

Attrition.

Marine Corps records provided attrition data. Separate analyses were performed for BT and the FMF to determine whether predictors of BT attrition also predicted FMF attrition.

For the BT analyses, successful recruits were those men still in the Marine Corps at the end of BT. Subgroups within this category were regulars (n = 1896) who had signed on for a standard duty tour and reservists (n = 405) who were undergoing initial active duty training. Reservists were distinguished from

regulars because exploratory analyses showed these recruits to be markedly different from the average.

In the BT analyses, unsuccessful recruits were those recruits who discharged prior to completing BT. This general category included medical attrites (n = 136) and behavioral attrites (n = 163). The first group was discharged for medical problems and the second for fraudulent enlistment, poor performance, unsuitability, misconduct, or erroneous enlistment. Erroneous enlistments (n = 11) were grouped with behavioral attrites because this type of discharge involved a past history of behavioral problems (e.g., a juvenile record). BT attrition status could not be determined for 48 men; these men were therefore excluded from the analyses.

FMF attrition analyses were based on the FMF status of the 2,301 BT graduates 27 months after completing BT. In these analyses, successful Marines included regulars still in the Marine Corps at the time of follow-up (n = 1571) and men discharged upon satisfactory completion of their obligated active duty (n = 450). This later group included reservists who successfully completed their initial active duty tour (n = 425) and a small number of discharges for reasons such as return to school, family problems, etc. (n = 25).

Unsuccessful Marines in the FMF analysis again included medical attrites (n = 42) and behavioral attrites (n = 198). The behavioral attrition category included 29 men discharged for miscellaneous reasons (e.g., pseudofolliculitis barbae, obesity). Analyses which assessed the effects of this classification decision showed that: (a) The miscellaneous attrites had social and psychological characteristics similar to those of the behavioral attrites. (b) The conclusions from the FMF attrition analyses were not substantially altered by the classification decision. FMF attrition data were missing for 60 men who were therefore not included in the analyses.

FMF Advancement

Rank after 27 months of service was used to indicate rate of advancement in the FMF for those participants still in the service at the time of follow-up. The range of ranks at this time was E-1 to E-5.

Analysis Procedures

The following procedures were carried out to identify a minimum set of recruit characteristics which reliably predicted BT outcomes.

(a) The sample was randomly divided into a 70% prediction sample and a 30% replication sample.

(b) Initial analyses considered one predictor at a time. Pearson product-moment correlations assessed the relationships between psychosocial characteristics and BT performance and health measures. Race was coded White = 1 and Nonwhite = 2. A one-way analysis of variance (ANOVA) was used to identify significant associations between psychosocial characteristics and attrition. These analyses compared the regular, reservist, medical attrite, and behavioral attrite groups defined in the preceding Attrition section. Separate attrition analyses were carried out for BT and the FMF periods.

(c) A result was significant if its probability of occurring by chance was less than 5% (two-tailed) in the 70% prediction sample and less than 10% (one-tailed) in the 30% replication sample. The replication criterion insured adequate statistical power to detect even small effects (30). Small effects could be important for describing BT stress effects if the recruit population consists of a mixture of some recruits who are strongly affected by stress and others who are largely unaffected (see p. 1).

(d) Significant attrition ANOVA results were followed by examination of four planned contrasts: (i) successful recruits vs. unsuccessful recruits; (ii) successful recruits vs. behavioral attrites; (iii) successful regulars vs. unsuccessful recruits; and (iv) successful regulars vs. behavioral attrites. These contrasts provided details describing the specific group differences that led to the overall significant attrition ANOVA. Behavioral attrition was emphasized because psychological and social factors seemed likely to contribute to the types of behavioral problems that led these recruits to attrite. At least one contrast had to meet the significance criterion in (c) for the ANOVA result to be accepted as significant. This additional significance criterion for the attrition analyses ensured that a variable was not accepted as a significant predictor of attrition status if the pattern of group differences producing the significant overall ANOVA was totally dissimilar in the two subsamples or if the initial significant finding depended primarily on the contrast between reservists and regular recruits. Analyses which will not be reported here showed that the different attrition groups did not differ significantly with respect to any psychosocial characteristic.

(e) A reduced subset of significant predictors was obtained from stepwise multivariate analyses. The stepwise analyses identified a minimum subset of the significant predictors which adequately portrayed the predictive power of the full set. Forward stepwise multiple regression combined the background and psychological predictors of performance and health into overall prediction equations. Forward stepwise discriminant function analysis using Rao's V as the selection criterion provided an overall prediction equation for attrition. Prediction weights were developed in the 70 percent sample and cross-validated in the 30 percent sample. The 5% significance level was the criterion for inclusion at each step.

The results of the multivariate analyses have been emphasized in the presentation of the results. This emphasis simplifies the description of the findings and is consistent with our objective of identifying a minimum set of recruit characteristics to be taken into account in BT stress studies. Details of the initial univariate analyses are available from the authors.

RESULTS AND IMPLICATIONS

Performance

Performance findings are summarized in Table 1. The percent of variance in a performance measure accounted for by a given predictor indicates the strength of the effect of that variable considered alone. The squared multiple

correlation (R^2) shows how well performance differences can be explained by the set of predictors. The R^2 can be less than the sum of the individual effects. This is true because predictors sometimes overlap. For example, people with high GCT scores also tend to have higher grades. Therefore, both predictors explain some of the same performance variation. In this case, R^2 will be less than the sum of the individual effects when the predictors are combined into one predictive equation. Major results were:

- Significant associations were found with much greater than chance frequency. Correlations between each recruit characteristic and each performance measure were computed. If the results of this analysis were due purely to chance factors, only 0.25% of the correlations would be statistically significant. Instead, significant associations were observed for (i) 40% of the social background associations, (ii) 34% of the coping associations, (iii) 49% of the defense correlations, (iv) 18% of the motivation correlations, and (v) 47% of the "other" correlations. The statistically significant predictors from this initial analysis step were then used in the stepwise regressions which produced the results described below.

- The hypotheses presented in the introduction were supported. The five hypotheses yield specific predictions of better or worse performance for 49 of the 57 associations reported in Table 1. Of the 49 associations, 45 (91.8%) were consistent with our hypotheses. Three of the four exceptions were the negative associations between the predictor variable Skill Variety and the performance measures of Phase III physical fitness score, Conduct ratings, and the Senior Drill Instructor Subjective evaluations.

- The predictive power of the recruit characteristics measures was weak even though statistically significant. Except for some GCT predictions, individual predictors consistently explained less than 9% of the variation in performance. Collectively, recruit characteristics explained 3.2% to 24.0% of the individual differences in performance. Researchers regard such associations as small (30).

- A small subset of predictors can be substituted for the full set. At most 14 of the 49 predictors figured in any one regression (Table 1). Of the 49 predictors, 5 (10.2% of the total) accounted for 24 of 57 significant associations (42.1% of the total). Variables with more than 3 significant associations included: GCT (5 associations), White/Nonwhite (6 associations), Chance locus of control (4 associations), repeating a year in school (4 associations), and high school grades (4 associations).

Implications. GCT should be included in any study of BT performance because it significantly predicted 6 of 8 performance measures and was the only predictor to produce correlations as high as $r = .30$. Race, Chance locus of control, high school grades, and having to repeat a year of school each added significantly to GCT predictions for several of the performance measures. These variables therefore can be considered useful, but probably not critical, for studies of BT stress effects. Adding further predictors would provide very little improvement in predictions of performance.

TABLE 1

PSYCHOSOCIAL PREDICTORS OF PERFORMANCE IN TRAINING

PERFORMANCE MEASURE	PREDICTOR[a]	% VARIANCE IN SUBSAMPLE 70%[b]	30%[b]	EFFECT[a]
Phase I Practical	GCT (5)[d]	20.5	21.8[c]	Better
	Chance (4)	4.0	2.7	Worse
	H. S. Diploma (1)	0.7	1.3	Better
	White/Nonwhite (5)[f]	5.8	3.9	Worse
	H. S. Grades (1)	2.1	0.9	Better
	Ran Away from Home (1)	0.3	1.4	Worse
	Years of School (1)	0.4	1.3	Better
	Repeat School Year (1)	2.9	3.5	Worse
	Suppression (2)	3.2	3.4	Better
	Displacement (3)	1.2	1.2	Worse
	Substitution (2)	1.4	1.7	Better
	Concentration (2)	1.0	2.6	Better
	Worked During Summer (1)	1.1	0.8	Better
	Objectivity (2)	1.5	0.6	Better
	Multiple R^2	*24.0*	*23.0*	
Final Oral	GCT (5)	9.0	8.7[c]	Better
	Repeat School Year (1)	1.8	1.0	Worse
	Task Significance (4)	0.6	1.8	Better
	H. S. Grades (1)	1.8	1.3	Better
	White/Nonwhite (5)[f]	2.4	1.7	Worse
	Chance (4)	0.6	3.2	Worse
	Rationalization (3)	1.1	0.8	Worse
	Regression (3)	0.2	2.2	Worse
	Suppression (2)	2.3	3.1	Better
	Multiple R^2	*11.6*	*7.3*	
Final Written	GCT (5)	18.5	21.2[c]	Better
	White/Nonwhite (5)[f]	5.4	5.5	Worse
	H. S. Grades (1)	2.4	0.7	Better
	Worked During Summer (1)	0.6	1.8	Better
	H. S. Diploma (1)	0.5	1.1	Better
	Displacement (3)	0.7	0.7	Worse
	Rationalization (4)	1.1	0.5	Worse
	Multiple R^2	*20.3*	*22.1*	
Phase I Physical Fitness Test	Participation in School Athletics (1)[d]	4.9	2.9[c]	Better
	Age (5)	1.0	0.6	Worse
	Doubt (3)	1.9	2.0	Worse
	White/Nonwhite (5)[f]	0.5	0.9	Better
	Chance (4)	0.6	0.3	Worse
	Multiple R^2	*7.8*	*6.8*	

(Continued)

TABLE I

PSYCHOSOCIAL PREDICTORS OF PERFORMANCE IN TRAINING

PERFORMANCE MEASURE	PREDICTOR[a]	VARIANCE IN SUBSAMPLE 70%[b]	VARIANCE IN SUBSAMPLE 30%[b]	EFFECT[c]
Phase III Physical Fitness Test	Substitution (2)	1.3	1.5[e]	Better
	Participation in School Athletics (1)	2.9	0.7	Better
	White/Nonwhite (5)[f]	0.9	1.6	Better
	Skill Variety (4)	0.3	0.2	Worse
	Sublimination (2)	1.0	0.3	Better
	Multiple R^2	*4.8*	*3.2*	
M-16 Score	GCT (5)	6.1	8.0[e]	Better
	White/Nonwhite (5)[f]	3.6	4.2	Worse
	Played Hooky (1)	0.5	1.2	Better
	Reaction Formation (3)	0.8	0.6	Better
	Multiple R^2	*5.6*[g]	*11.6*	
Conduct Rating	GCT (5)	3.3	5.9	Better
	H. S. Diploma (1)	2.9	0.7	Better
	Participation in School Activities (1)	2.1	2.6	Better
	Repeat School Year (1)	2.6	1.9	Worse
	Skill Variety (4)	0.9	1.3	Worse
	Multiple R^2	*6.8*	*10.9*	
Sr. Drill Instructor Subjective Evaluation	Powerful Others (4)[d]	3.4	0.9[e]	Worse
	GCT (5)	3.6	5.9	Better
	Repeat School Year (1)	2.2	1.7	Worse
	H. S. Grades (1)	2.3	0.8	Better
	Chance (4)	0.9	1.1	Worse
	Skill Variety (4)	0.7	2.4	Worse
	Participation in School Activities (1)	1.5	1.7	Better
	Multiple R^2	*9.6*	*9.6*	

[a] Predictors include those variables which (i) were significant univariate predictors of the performance measure and (ii) entered the stepwise regression equation for the performance measure (see p. [illegible] for details).

[b] See p. 7 for subsample definitions.

[c] Effect refers to whether the predictor variable was associated with better or worse performance.

[d] Predictors have been grouped as: (1) social background measures, (2) coping measures, (3) defense mechanism measures, (4) motivation measures, and (5) "other" recruit attributes (see p. 2). Numbers in parentheses indicate group membership. Details concerning the predictors are given in the Method section.

[e] Entries are based on simple bivariate correlations for the indicated predictors. The multiple correlation squared (R^2) indicates the combined predictive power of the set of indicated predictors. R^2 was computed [illegible] in the 70% subsample for both subsamples.

[f] Race was arbitrarily scored "White" = 0 and "Nonwhite" = 1. The indicated effects therefore reflect how well Nonwhites did compared to Whites.

[g] The multiple correlation was less than the bivariate correlation for GCT because [illegible] regression [illegible] reduced the GCT correlation.

TABLE 2

PSYCHOSOCIAL PREDICTORS OF HEALTH DURING BASIC TRAINING

HEALTH MEASURE	PREDICTOR[a]	VARIANCE IN SUBSAMPLE 70%[b]	VARIANCE IN SUBSAMPLE 30%[b]	EFFECT[c]
Total Sick Call Visits	Intellectualization (3)[d]	0.7	0.8[c]	More
	Rationalization (3)	0.5	0.7	More
	Skill Variety (4)	0.7	0.4	More
	Internal (4)	0.7	0.5	More
	Multiple R^2	*2.9*	*2.6*	
Total Days Light Duty	Parents' Marital Status (1)	0.5	1.1[c]	Fewer
	Participation in Unofficial Athletics (1)	0.7	0.5	Fewer
	Multiple R^2	*1.0*	*1.2*	
Viral Incidents	Ran Away from Home (1)	1.8	1.2[c]	More
	Intellectualization (3)	0.8	0.5	More
	Multiple R^2	*2.6*	*2.0*	
Trauma Incidents	Participation in School Athletics (1)	0.8	0.7[c]	Fewer
	White/Nonwhite (5)[f]	0.5	1.1	Fewer
	Multiple R^2	*1.0*	*1.6*	

[a] Predictors include those variables which *(i)* were significant univariate predictors of the health measure and *(ii)* entered the stepwise regression equation for the health measure (see p. 8 for details).

[b] See p. 7 for subsample definitions.

[c] Effect indicates whether the predictor variable was associated with 'more' or 'fewer' health problems.

[d] Predictors have been grouped as (1) social background measures, (2) coping measures, (3) defense mechanism measures, (4) motivation measures, and (5) 'other' recruit attributes (see p. 21). Numbers in parentheses indicate group membership. Details concerning the predictors are given in the Method section.

[e] Entries are based on simple bivariate correlations for the individual predictors. The multiple correlation coefficient (R^2) indicates the combined predictive power of the set of individual predictors. R^2 was computed using regression weights developed in the 70% subsample for both subsamples.

[f] Race was arbitrarily scored 'White' = 0 and 'Nonwhite' = 1. The indicated effects therefore reflect how well Nonwhites did compared to Whites.

Health

Psychosocial variables consistently explained less than 3% of the variation in the health outcomes (Table 2). No individual predictor explained as much as 2% of the variance in any of the health measures.

Implications. Psychosocial characteristics were clearly not major factors in health during BT. There was no evidence that a failure to consider psychosocial characteristics would lead to inaccurate estimates of the effects of BT stresses on health in AT.

Basic Training Attrition

The BT attrition analysis compared four groups of recruits--reservists who completed BT, regular enlistees who completed BT, recruits discharged from BT for medical reasons, and recruits discharged from BT for behavioral problems (see pp. 6-7 for group definitions). The analysis results showed:

- Psychosocial characteristics differed significantly between attrition groups with a greater than chance frequency. Univariate analyses showed significant differences for 40% of the coping mechanism scales (4 of 10), 70% of the defense mechanism scales (7 of 10), 18% of the motivation measures (2 of 11), 13% of the social background measures (2 of 15) and 67% of the "other" recruit attributes category (2 of 3; GCT and age). Each of these figures greatly exceeds the 0.25% that would be expected to be significant by chance.

- The differences between successful and unsuccessful recruits were consistent with our general hypotheses. As predicted, successful recruits scored higher than unsuccessful recruits on each of the four coping mechanism measures that differed significantly between groups. With regard to other significant differences, successful recruits scored lower on 5 of 7 defenses, higher on 2 of 2 motivation measures, showed better social adjustment for 2 of 2 social background measures and had higher average GCT scores. Overall, 14 of 17 (82.4%) significant differences were in the predicted direction.

- The stepwise discriminant function included at least one predictor from each of the five major categories. Significant predictors in the stepwise discriminant function analysis included one coping scale (suppression), one defense scale (displacement), one motivation measure (enlistment expectations), one social background measure (high school grades), and GCT and age (Table 3, p.14).

- Reservists significantly affected the findings. The difference between the reservists and the other three groups was the primary reason why high school grades and GCT entered the discriminant function. Comparisons between the regulars and the unsuccessful recruits were nonsignificant for these two variables (Table 3, p. 14).

- Psychosocial characteristics do not accurately predict which specific recruits will attrite from BT. The differences between groups were small even though statistically significant and reliable. Thus, the results can be used to describe the characteristics of attrites, but not to predict the success of individual recruits (31).

The six variables listed in Table 3 should be included in studies of BT stress. Based on the theoretical nature of the variables, the conclusions from the findings are:

(a) The ability to manage emotional reactions helps recruits succeed in BT. Successful recruits scored higher on suppression and lower on displacement. Both of these trends imply poorer management of emotions by unsuccessful recruits (7). La Rocco, Ryman, and Biersner (13) reported that strong emotional reactions predict BT attrition, a finding which has been replicated by other

TABLE 3

REDUCED SET OF PREDICTORS FOR BASIC TRAINING ATTRITION

PREDICTOR	SAMPLE	RESERVISTS[a] Mean	RESERVISTS[a] S. D.	REGULARS[a] Mean	REGULARS[a] S. D.	MEDICAL ATTRITES[a] Mean	MEDICAL ATTRITES[a] S. D.	BEHAVIORAL ATTRITES[a] Mean	BEHAVIORAL ATTRITES[a] S. D.	SIGNIFICANCE OF COMPARISONS[b] A	B	C	D	E
Suppression[c]	70%	.539	.110	.503	.107	.488	.101	.441	.109	.001	.001	.001	.001	xxxx
	30%	.529	.105	.501	.105	.477	.112	.479	.098	.005	.005	.032	.067	xxxx
Displacement[c]	70%	.443	.138	.480	.128	.526	.122	.550	.137	.001	.001	.001	.001	.001
	30%	.473	.122	.483	.124	.523	.131	.526	.142	.021	.005	.043	.010	.067
Enlistment Expectations[d]	70%	5.76	0.94	5.83	0.83	5.37	1.53	4.97	1.65	.001	.001	.001	.001	.001
	30%	5.77	0.88	5.90	0.86	5.58	1.19	5.47	1.24	.004	.026	.066	.008	.032
High School Grades[e]	70%	3.22	0.77	3.04	0.73	2.94	0.77	2.97	0.84	.002	.007	.059	xxxx	xxxx
	30%	3.26	0.71	3.05	0.70	3.12	0.66	2.77	0.89	.001	.021	.008	xxxx	xxxx
GCT Score	70%	107.84	17.46	103.78	16.20	104.76	12.98	97.76	19.26	.001	.001	.001	xxxx	xxxx
	30%	106.25	17.56	103.47	15.88	101.29	13.36	99.82	18.31	.075	.027	.087	xxxx	xxxx
Age	70%	18.79	1.79	18.90	1.85	19.26	2.00	19.34	2.17	.017	.005	.019	.011	.034
	30%	18.65	1.65	18.84	1.96	19.47	1.96	19.48	2.18	.013	.003	.035	.010	.069

[a] See Method (p. 6) for definitions of groups.

[b] Comparisons: A = Overall analysis of variance
B = Successes vs. Failures
C = Successes vs. Behavioral Attrites
D = Successes vs. Failures
E = Regulars vs. Behavioral Attrites

See text for group definitions. All significance indicators are two-tailed. "xxxx" indicates that the comparison was not significant.
See Method (p. 8) for definition of significance criteria.

[c] Scores can range from 0.000 to 1.000.

[d] Scores can range from 1.00 to 7.00.

[e] Scores can range from 1.00 to 5.00.

researchers (15,22). Negative emotions represent one type of response to stress and may help translate stress into adverse behavioral or health outcomes (6-9). Therefore, suppression and displacement may help link previous findings regarding recruit emotionality to observations that imply BT stress is related to BT attrition (11,21).

(b) Failure may be a self-fulfilling prophecy for some recruits. The most important motivational variable was enlistment expectations, i.e., the recruit's belief that he will successfully complete his obligated tour of duty. This confirmed previous reports by others (20,21,23). Low initial expectations of success may lead to minimal effort in BT because the recruit either does not believe he can succeed or does not think he wants to succeed. If the recruit has the basic ability required to succeed, failure is then a self-fulfilling prophecy, i.e., an outcome generated by the recruit's own predictions. However, initial enlistment expectations may be modified by actual BT experiences. Studies of BT stresses should therefore determine how stresses affect expectations for success.

(c) GCT and high school grades were useful primarily for distinguishing reservists from other recruits. Reservists appear to be a special group of recruits who should be distinguished from others to fully understand attrition trends. This point has been overlooked in some prior research. At present, this limitation on the discriminative power of GCT and high school grades combined with the fact that there is no strong theoretical basis linking these variables to BT stress reactions makes it unlikely they will be important for understanding which recruits react strongly to stresses. Previous studies have shown weak associations between these recruit attributes and perceptions of BT, including BT stresses, and no evidence that they modify the effects of BT stresses (34).

(d) The relationship between age and BT attrition has changed since the 1960s. Until the mid-1970s, younger recruits were more likely to attrite than older recruits. Recently, the trend has been toward higher attrition among older recruits (14,23). Age can be an indirect indicator of many types of social or psychological differences. The age-attrition relationship may have changed over time because changing social conditions have altered enlistment patterns so that age differences now reflect different underlying characteristics than they did in the 1960s. Although this interpretation is speculative, the shift to an all-volunteer force is one way such a change could have come about. In any event, two previous studies produced no evidence that age differences affected either perceptions of BT stresses or reactions to those stresses (34).

Implications. Displacement, suppression, enlistment expectations, and age should be added to the list of psychosocial characteristics to be considered in studies of BT stresses. Plausible theoretical arguments lead to the conclusion that displacement, suppression, and enlistment expectations have a high probability of determining which recruits are more sensitive to stress (see above) and thus are most likely to be adversely affected by BT stresses. However, the findings also made it clear that psychosocial characteristics do not provide precise prediction of which specific recruits will attrite. These psychosocial measures therefore would not be suitable for use as screening instruments to reduce attrition rates.

TABLE 4

MARINE CORPS OUTCOMES FOR HIGH AND LOW BASIC TRAINING RISK SCORERS

OUTCOME CATEGORY	70% SAMPLE		30% SAMPLE		COMBINED	
	H[a]	L	H	L	H	L
Reservist	11.8%	23.6%	14.2%	28.0%	12.5%	25.0%
Fast[b]	9.7%	26.4%	10.2%	20.7%	9.9%	23.6%
Normal[c]	32.9%	33.6%	36.7%	28.7%	34.0%	32.1%
Slow[d]	8.8%	7.2%	5.4%	10.0%	7.8%	8.1%
BT Medical[e]	8.5%	2.8%	10.2%	2.7%	9.0%	2.8%
FMF Medical[e]	1.8%	1.3%	2.0%	0.7%	1.8%	1.1%
BT Behavior[e]	16.2%	1.3%	11.6%	3.3%	14.8%	1.9%
FMF Behavior[e]	7.9%	3.1%	6.1%	4.7%	7.4%	3.4%
FMF Miscellaneous[e]	2.4%	0.6%	3.4%	1.3%	2.7%	0.9%
Total BT Attrition[f]	*24.7%*	*4.1%*	*21.8%*	*6.0%*	*23.8%*	*4.7%*
Total FMF Attrition[g]	*12.1%*	*5.0%*	*11.5%*	*6.7%*	*11.9%*	*5.4%*
Total Number in Group	*340*	*318*	*147*	*150*	*487*	*468*

[a] 'H' and 'L' refer to high and low BT risk categories. Classification is based on falling in the upper or lower 20% of the scores for the BT attrition risk function (see text for details).

[b] Rank of E-4 or E-5 and still in the service at the time of follow-up.

[c] Rank of E-3 and still in the service at the time of follow-up.

[d] Rank of E-1 or E-2 and still in the service at the time of follow-up.

[e] Attrition category for basic training (BT) and the Fleet Marine Force (FMF). 'FMF Miscellaneous' is FMF attrition not falling in one of the FMF categories listed above.

[f] Sum of BT Medical and BT Behavior. Included to show the discriminating power of the BT risk score in Basic Training.

[g] Sum of FMF Medical, FMF Behavior, and FMF Miscellaneous.

Fleet Marine Force Attrition

FMF attrition analyses asked: Does the psychosocial profile that predicts BT attrition also predict FMF attrition? If so, do any additional psychosocial variables improve the prediction of FMF attrition?

A BT attrition risk score was created to determine whether BT graduates with psychosocial profiles similar to those of BT attrites were at higher risk of FMF attrition. The six variables listed in Table 3 were combined into an overall risk score using weights for the first function in the BT discriminant function analysis. This discriminant function accounted for 71% of the variance

explained in that prior analysis and differentiated the attrition groups from the reservists and the regular recruits. For these analyses, the risk function was scored so that BT attrites had higher scores than BT graduates. Results were:

- Recruits falling in the lowest and highest 20% of the scores for the BT risk function were classified as "low risk" and "high risk," respectively. During BT, recruits falling in the middle range of risk scores had an attrition rate very close to the sample average. The high-risk group was of most interest in our analyses of FMF attrition and comparison to a low-risk group provided a sharper contrast than comparison to all other recruits.

- The overall FMF attrition rate in the high risk group was 2.2 times that in the low risk group (11.9% vs. 5.4%; see Table 4).

- The proportion of recruits who advanced faster than average was 2.5 times higher in the low risk group than in the high risk group (Table 4). Although our major concern was with attrition, this finding indicates that those high risk individuals who do not attrite perform more poorly on the average than low risk individuals.

- The average BT attrition risk score differed significantly when FMF successes and failures were compared. Miscellaneous FMF attrites were combined with the behavioral attrites for this analysis (see p. 7 for group definitions), because their BT risk scores suggested that most were behavioral problems (see Table 4). Although the between group differences in risk were not particularly pronounced in the 30% subsample, the combined results for the 70% and 30% subsamples showed a consistent tendency toward higher BT risk scores in the attrition groups. This trend would undoubtedly be stronger if a substantial number of high risk recruits had not attrited during BT.

The usefulness of adding other predictors to the BT risk score to predict FMF attrition was determined as follows: (i) Univariate ANOVAs identified significant FMF attrition predictors. (ii) A stepwise discriminant function analysis was carried out entering the BT attrition risk score as the first predictor then entering the predictors which were significant in (i). (iii) A second stepwise discriminant function analysis was done with just the significant FMF attrition predictors from (i). Results were:

- The least effective predictor category for BT attrition was the most effective for predicting FMF attrition. Univariate analysis showed significant group differences for 7 of 15 social background measures, 2 of 10 defense mechanisms, 1 of 10 coping mechanisms, 1 of 11 motivation measures, and 0 of 3 "other" attributes. The frequency of significant associations was therefore 47%, 20%, 10%, 9%, and 0% compared to 13%, 70%, 40%, 18%, and 67% for the same predictor categories in the BT attrition analysis.

TABLE 5

REDUCED SET OF PREDICTORS FOR FLEET MARINE FORCE ATTRITION

PREDICTOR	SAMPLE	RESERVISTS[a] Mean	RESERVISTS[a] S. D.	REGULARS[a] Mean	REGULARS[a] S. D.	MEDICAL ATTRITES[a] Mean	MEDICAL ATTRITES[a] S. D.	BEHAVIORAL ATTRITES[a] Mean	BEHAVIORAL ATTRITES[a] S. D.	SIGNIFICANCE OF COMPARISONS[b] A	B	C	D	E
BT Risk Score[c]	70%	−.302	1.041	−.096	.902	−.058	1.017	.208	.897	.000	.019	.001	xxxx	xxxx
	30%	−.109	.887	−.233	.987	.266	1.119	.110	1.000	.062	.065	.063	xxxx	xxxx
Suppression[d]	70%	.537	.108	.508	.107	.500	.129	.463	.103	.001	xxxx	.001	xxxx	xxxx
	30%	.531	.106	.502	.104	.518	.086	.471	.114	.003	xxxx	.009	xxxx	xxxx
Years of School	70%	12.04	1.15	11.75	0.93	11.83	0.85	11.30	0.97	.001	.002	.001	.059	.001
	30%	11.89	0.93	11.73	0.97	11.54	0.78	11.21	1.00	.001	.004	.001	.013	.001
School Expulsions[e]	70%	0.72	1.12	0.89	1.24	0.70	1.20	1.42	1.44	.001	xxxx	.001	xxxx	.001
	30%	0.85	1.21	0.91	1.19	0.31	0.63	1.43	1.41	.001	xxxx	.009	xxxx	.012

[a] See Method (p. 7) for definition of groups.

[b] Comparisons: A = Overall analysis of variance
B = Successes vs. Failures
C = Successes vs. Behavioral Attrites
D = Regulars vs. Failures
E = Regulars vs. Behavioral Attrites

See p. 7 for group definitions. All significance indications are two-tailed. "xxxx" indicates that the comparison was not significant by the criterion defined in Method (see p. 8).

[c] BT risk score was a composite of the variables that predicted BT attrition (see text).

[d] Scores can range from 0.000 to 1.000.

[e] Scores can range from 0.00 to 4.00.

- Fewer years of education and more school expulsions were the significant predictors in the analysis that included the BT risk score (Table 5).

- When BT risk was excluded from the analysis, suppression was added to the predictor set. Suppression is apparently the key element of BT attrition risk for predicting FMF attrition. For this reason, suppression has been included in Table 5, but it should be kept in mind that the equation for discriminating FMF attrition groups included either BT risk or suppression, [illegible]h.

Implications. One important conclusion is that **scores identify recruits whose FMF performance will be below average.** Compared to low risk recruits, high risk recruits advanced less rapidly and were more likely to attrite. These trends probably would have been stronger if BT attrition had not eliminated some of the extreme risk individuals. BT attrition may remove marginal performers early in their careers prior to major investments in their training, etc. This conclusion has important implications for the interpretation of BT attrition, so our findings should be replicated to ensure their generality.

A second conclusion is that **the psychosocial profile describing FMF attriters includes factors beyond those that characterize BT attriters.** In particular, FMF attrition is associated with fewer years of education and greater frequency of being expelled from school. These added predictors suggest marginal social adaptation in the recruit's only previous experience with a major social institution. Thus, the added predictors may indicate a general tendency to adapt poorly to the demands of social institutions.

Differences in BT attrition and FMF attrition are of interest because they may help to understand overall patterns of Marine Corps attrition. In particular, attention should be given to isolating factors which identify recruits in the high BT risk category who subsequently perform effectively in the FMF. Two possibilities which may be worth further study are:

(a) A recruit's score on the variables which predict BT attrition can change over time. For example, expectations regarding success in completing one's enlistment change during BT (20). Similarly, changes in personality are not unreasonable in young men exposed to major new life experiences. The recruit's Marine Corps experiences and normal maturation may therefore alter his initial risk of failure.

(b) The FMF and BT environments differ substantially. BT is highly structured and of short duration. Psychologically, BT is probably viewed as a brief period of challenge and stress. In contrast, the FMF is less structured, of longer duration, and more routine. These differences may make different psychosocial characteristics important for success in the two environments.

CONCLUSIONS

Our study objective was to identify a small number of psychosocial predictors which were especially important for understanding BT stress effects. Two types of predictors were expected. The first type consisted of psychosocial variables which determine how strongly a recruit reacts to BT stresses. The second type included all psychosocial variables which directly affect performance. If these variables are not taken into account in stress studies, the precision of stress effect estimates will be reduced. We began with five major categories of possible predictors: social background characteristics, coping mechanisms, defense mechanisms, motivational factors, and "other" attributes.

The study broadly replicated previous research showing that better BT outcomes were associated with: (a) A past history of good social adjustment; (b) Greater ability to cope with stress; (c) Less defensiveness; (d) Higher motivation; and (e) Higher GCT scores. Success was also more likely among younger recruits. This result is contrary to research findings prior to the mid-1970s which showed younger recruits to be less successful. However, the finding is consistent with trends reported in several more recent studies.

The analyses which related recruit characteristics to BT performance should be most useful in identifying variables which directly affect performance. The results from those analyses showed that GCT was the most useful predictor of BT performance and should be included in studies of BT stress. Race, Chance locus of control, having had to repeat a school year, and high school grades were weaker and less consistent predictors of performance. These variables may be worth including in studies of BT stress because of their effects on performance, but they are not as critical as GCT.

BT attrition is a particularly interesting and important criterion for identifying recruit characteristics which may determine reactions to BT stresses. Previous research has linked BT attrition to BT stresses (11,21) and to negative moods which may be responses to those stresses (13,15,22). Also, the most common types of discharge for BT attrites (misconduct, unsuitability) imply behavioral problems that represent more than just poor performance. Behavioral problems that lead to BT attrition may be habits learned in prior social settings, but they could also be reactions to the stresses in BT.

Analyses relating recruit psychosocial characteristics to BT attrition identified three variables which, on the basis of stress theories, may determine

whether a recruit responds strongly to BT stresses. These variables included emotional control factors (specifically, displacement and suppression), and motivation (expected success in the Marine Corps). Emotional control and motivation are particularly likely to promote an understanding of BT stress effects, because strong emotional responses and low motivation are frequently assumed to be major effects of stress.

Age, GCT, and high school grades also predicted BT success and therefore may be factors which modify BT stress reactions. However, it is more likely that these variables affect the probability of attrition in some other way. Stress theories do not predict that these variables will influence either how stressful the recruits feels the situation is or how he reacts to that stress. Furthermore, prior studies have not shown substantial relationships between these three variables and either reported stress or effects of stress (34).

Overall, the the minimum set of psychosocial variables which should be considered when studying BT stress effects includes GCT, displacement, suppression, enlistment expectations, high school grades, and age. Race, Chance locus of control, and having to repeat a year of school can be regarded as optional variables for studying BT stresses. A report describing the effect of these psychosocial characteristics on reactions to BT stresses is in preparation (35).

Another important finding was that **BT graduates who possessed characteristics associated with BT attrition were less successful in the FMF than recruits who did not possess these characteristics.** BT attrition therefore may effectively remove some recruits who would be marginal performers in the FMF. This possibility has important implications for the evaluation of BT attrition. However, these findings must be replicated before they are accepted as reliable.

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APPENDIX A

Background Questionnaire

BACKGROUND QUESTIONNAIRE

Name: _____ SSN: _____

Today's Date: ____/____/____ (Day / Month / Year) Platoon: _____ Squad: _____

Instructions: The following questions are about your background prior to enlistment. For each question, write [illegible] mark the answer which best applies to you.

1. Age: _____ yrs. old. 2. Birthdate: ____/____/____ (Day Mo Year) 3. Birthplace (City & State): _____

4. Marital Status:
   - ☐ single (never married)
   - ☐ married
   - ☐ separated, divorced, or widowed

5. Race:
   - ☐ Caucasian
   - ☐ Black
   - ☐ Cuamanian or Filipino
   - ☐ Asian
   - ☐ American Indian
   - ☐ Chicano/Latino
   - ☐ Other (specify): _____

6. Education: _____ (total years completed) 7. High School Diploma?
   - ☐ No
   - ☐ Yes
   - ☐ GED

8. Did you ever repeat a school year?
   - ☐ No
   - ☐ Yes

9. On the average, how were your grades in high school?
   - ☐ occasional failures
   - ☐ below average
   - ☐ average
   - ☐ above average
   - ☐ excellent

10. During high school, how many times did you . . . ?

	Never	Once	Twice	3 Times	4 or more
a. run away from home	☐	☐	☐	☐	☐
b. play 'hooky' from school	☐	☐	☐	☐	☐
c. get suspended or expelled from school	☐	☐	☐	☐	☐
d. get in trouble with or arrested by the police (other than for traffic violations)	☐	☐	☐	☐	☐

11. On the average, during high school, how many *hours per week* did you work at a job . . . ?

	None	1 - 10	11 - 20	21 - 30	31 or more
a. during the school year	☐	☐	☐	☐	☐
b. during summer vacation	☐	☐	☐	☐	☐

12. During high school, how often did you . . . ?

	Rarely	Once in a while	Sometimes	Pretty often	Frequently
a. participate in school activities (e.g., clubs, dances, band, etc.)	☐	☐	☐	☐	☐
b. participate in activities outside of school (e.g., church, YMCA, Scouts, etc.)	☐	☐	☐	☐	☐
c. participate in official athletic events (e.g., school teams, League teams, etc.)	☐	☐	☐	☐	☐
d. participate in unofficial athletic events (e.g., neighborhood games, sand lot, etc.)	☐	☐	☐	☐	☐

13. I spent most of my childhood in a:
   - a. ☐ Farm, rural area, small town (pop. under 5,000)
   - b. ☐ Town (population 5,000--50,000)
   - c. ☐ City (population 50,001–500,000)
   - d. ☐ Large city (population over 500,000)

14. Are your parents still living?

	No	Yes
a. Mother	☐	☐
b. Father	☐	☐

15. My parents are . . .
   - a. ☐ married and still living together
   - b. ☐ separated
   - c. ☐ divorced
   - d. ☐ Other (specify): _____

16. Before joining the Marine Corps I was living with:
   - a. ☐ Mother and Father
   - b. ☐ Mother only
   - c. ☐ Father only
   - d. ☐ Mother and Stepfather
   - e. ☐ Father and Stepmother
   - f. ☐ Alone
   - g. ☐ Other (specify): _____

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APPENDIX B

OPERATIONAL DEFINITIONS OF THE MEASURES USED TO ASSESS RECRUITS' PSYCHOLOGICAL CHARACTERISTICS

OPERATIONAL DEFINITIONS OF THE MEASURES USED TO ASSESS RECRUITS' PSYCHOLOGICAL CHARACTERISTICS

The following pages provide brief definitions of the attributes measured by the psychological scales used in this study. The definitions have been phrased to describe the characteristics of the person who scores high on the scale in question. More detailed discussion of the theoretical models and methods used in developing the measures of coping processes and defensive processes can be found in Joffe and Naditch (29). Similar information for the locus of control scales can be found in Levenson's work (25-28) and for the Job Diagnostic Survey in Hackman and Oldham's (24) description of the development of these scales.

Coping Processes:

Objectivity: Separates ideas and feelings as required by the situations. Can be consciously of two minds.

Intellectuality: Can detach self from affect-laden situations to give impartial analysis, but still articulates and symbolizes feelings so they contribute to decisions and behavior.

Logical Analysis: Systematically analyzes causal aspects of situations, including motivational explanations.

Tolerance of Ambiguity: Can make qualified judgments and deal with cognitive and affective complexity and uncertainty.

Empathy: Puts self in the other person's shoes and can imagine how they feel; takes others' feelings into account in making decisions.

Regression in Service of the Ego: Utilizes feelings and ideas that are not part of the practical requirements of the situation to give better insight into problems and situation.

Concentration: Sets aside disturbing or attractive feelings or thoughts to concentrate on task at hand.

Sublimation: Finds self-satisfying, socially acceptable means of expressing "primitive" affect

Substitution: Expresses tempered, domesticated feelings that are appropriate, flexible, metered, and purposive.

Suppression: Infeasible, inappropriate affect and feelings are controlled until time, place, and object are proper for expression.

Defensive Processes

Isolation: Affect is not related to ideas, or seems unable to put ideas together. Unable to generalize, synthesize, or integrate meaningfully.

Intellectualization: Retreats from affect into formulations of words and abstraction at a level inappropriate to the setting.

Rationalization: Offers superficially plausible reasons for behavior that omit crucial aspects of situation; needs to offer causal explanations, e.g., "It's fate."

Doubt: Unable to resolve ambiguity or choose a course of action; hopes problems will solve themselves; worries about past decisions and behavior.

Projection: Attributes objectionable tendency of self to another and does not recognize it as part of self.

Regression: Resorts to evasive, wistful, demanding, dependent, ingratiating, behavior that is not age-appropriate to avoid responsibility, aggression, or unpleasant demands.

Denial: Denies present or past facts or feelings that would be painful in order to focus on benign or pleasant ones.

Displacement: Tries to control affects or impulses in relation to original object, then expresses them inappropriately in a more tolerant situation.

Reaction Formation: Appears to have transformed "primitive" impulses and feelings into opposites, but expression of both is excessively civilized, and sometimes breaks down.

Repression: Unconsciously and purposefully forgets, and is unable to remember past, or cannot elaborate.

Levenson's Locus of Control Scales

Internal Control: Believes that what happens to him or her in life in general and in specific situations such as making friends, driving a car, or achieving leadership positions, depends on his or her own actions or personal attributes.

Powerful Other Control: Believes that what happens in the situations described above is determined by the actions of other people who have the power to determine his or her fate.

Chance Control: Believes that what happens in the situations described above is due to fate, chance, circumstances, etc.

Job Diagnostic Survey Scales

Skill Variety: Perceives job as requiring a variety of differnt activities to carry out the work; sees job as requiring a number of different skills and abilities.

Task Identity: Perceives the job as requiring the completion of a whole, identifiable piece of work, i.e., doing a job with a visible outcome from beginning to end.

Task Significance: Perceives the job as having a substantial impact on the lives or work of others either in his immediate organization or in the external environment.

Autonomy: Perceives the job as providing substantial freedom, independence, and discretion to the employee with respect to scheduling work and determining procedures to be used to carry out these plans.

Feedback from the Job: Perceives the activities of the job as providing direct, clear information about the effectiveness or adequacy of his or her performance.

Feedback from Agents: Perceives the job as one in which the employee receives clear feedback about performance from supervisors or from co-workers.

Dealing with Others: Perceives the job as requiring the employee to work closely with other people to complete work activities.

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This report describes one study in a series carried out to assess the effects of Marine Corps basic training (BT) stresses on male recruits. The present study was undertaken to identify individual differences which must be taken into account to accurately evaluate BT stress effects.

Measures of 18 social background variables, 20 coping and defense mechanisms, 11 motivational variables, GCT, age, and race were obtained from [illegible]

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volunteers. Univariate analysis identified significant predictors of performance in BT, health during BT, and attrition during BT or in the first 27 months following BT. Multivariate procedures reduced the set of significant predictors to the minimum required to predict each outcome.

Results were: (a) GCT was the primary predictor of performance; race, Chance locus of control, high school grades, and having had to repeat a year of school were secondary predictors. (b) Health was not strongly related to any individual difference measure. (c) BT attrition was related to suppression, displacement, expected success in completing the first term of enlistment, intelligence (GCT scores), and age. (d) Recruits with psychosocial profiles similar to these which predicted BT attrition were less successful in the FMF. (e) FMF attrition was also associated with less education and more frequent expulsion from school.

Displacement, suppression, enlistment expectations, age, and GCT scores represent the minimum set of individual differences which must be considered to ensure an accurate assessment of BT stress effects. Because they are conceptually linked to motivation and effective management of emotions, the first three of these may be particularly useful for understanding previously reported relationships between BT success and stress and emotion. In general, Marine Corps attrition was linked to personality characteristics suggesting limited ability to adapt to stress and poor motivation and to a behavioral history suggesting mild social delinquency.